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# (12) United States Patent

Sahara et al.

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# (54) PRINTING APPARATUS AND CONTROL METHOD THEREOF

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CPC ...... **B41J 11/0095** (2013.01); **B41J 2/16526** (2013.01); **B41J 2/002/16573** (2013.01)

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# (56) References Cited

#### U.S. PATENT DOCUMENTS

6,702,274	B1*	3/2004	Otsuka B41J 13/0009		
			271/10.01		
7,377,611	B2 *	5/2008	Shimoyama B41J 13/0009		
7 562 061	D2 *	7/2000	347/16 Inoue B41J 2/16585		
7,302,901	DZ '	1/2009	347/104		
2004/0160475	A1*	8/2004	Satoh B41J 2/155		
200 1/0100 1/2		0/2001	347/36		
2005/0078145	A1*	4/2005	Inoue B41J 2/16585		
			347/31		
2005/0271437	A1	12/2005	Edamura et al.		
(Continued)					

#### FOREIGN PATENT DOCUMENTS

JP 2009-241261 A 10/2009

## OTHER PUBLICATIONS

U.S. Appl. No. 14/719,156, filed May 21, 2015. Applicant: Noriyuki Sugiyama, et al.

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# (57) ABSTRACT

A printing apparatus comprises a maintenance unit configured to execute a maintenance operation between a completion of printing on a preceding sheet serving as the printing sheet fed from a stacking unit first and a start of printing on a succeeding sheet serving as the printing sheet fed from the stacking unit next, and a determination unit configured to determine whether to execute the maintenance operation, wherein the determination unit determines, based on a feeding method of the succeeding sheet, whether to execute the maintenance operation.

## 9 Claims, 7 Drawing Sheets

	TYPE OF PRELIMINARY DISCHARGE	
DURING PRINTING OPERATION	EACH TIME FIRST TIME HAS ELAPSED SINCE FIRST PRELIMINARY DISCHARGE WAS EXECUTED LAST TIME	FIRST PRELIMINARY DISCHARGE
	EACH TIME SECOND TIME HAS ELAPSED SINCE FIRST OR SECOND PRELIMINARY DISCHARGE WAS EXECUTED LAST TIME	SECOND PRELIMINARY DISCHARGE